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(71) Applicant (for all designated States except US): LINDAL VALVE COMPANY LIMITED [GB/GB]; Cherrycourt Way, Stanbridge Road, Leighton Buzzard, Bedfordshire LU7 8UH (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): OWEN, Thomas, Philip [GB/GB]; "Catkins", Nash Road, Thornborough, Buckinghamshire MK18 2DR (GB). BELAU, Ruediger [DE/DE]; Finkenweg 9, D-23843 Bad Oldesloe (DE).

(74) Agent: GODWIN, Edgar, James; Marks & Clerk, 57-60 Lincoln's Inn Fields, London WC2A 3LS (GB).

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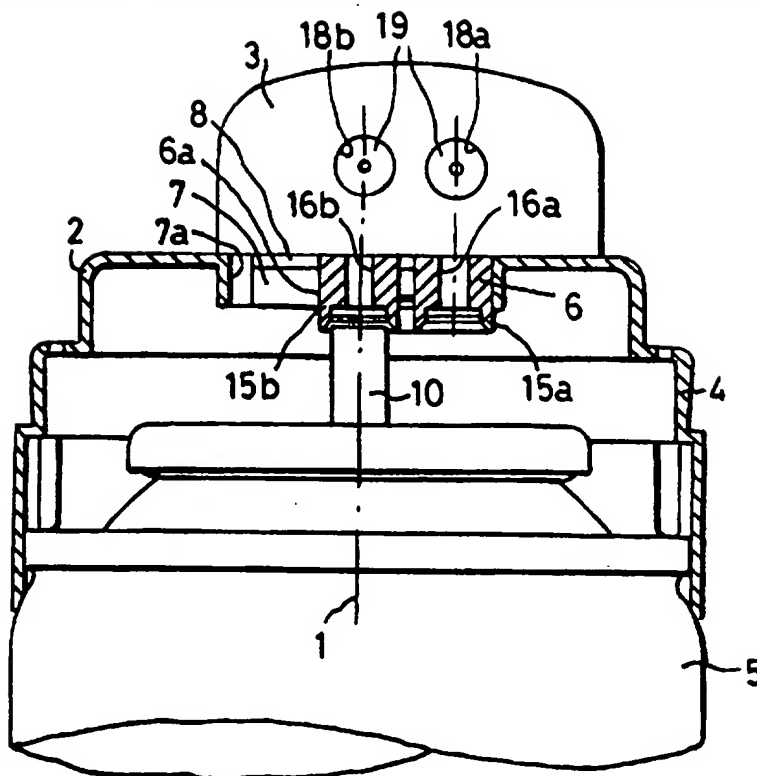
With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: DISPENSING ACTUATOR

(57) Abstract

A dispensing head (3) is mounted on an actuating body (2) so as to be slidable to respective first and second dispensing positions in which respective first and second outlet passageways (16a, 16b) in the head (3) receive pressurised fluid from an outlet valve (10) on a container (5) when the body (2) is moved to open the valve.



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Dispensing Actuator

This invention relates to a dispensing actuator for actuating a valve on a container of pressurised fluid which is to be dispensed through the actuator.

Such dispensing actuators may be used for dispensing pastes, gels, liquids (as jets or sprays), foams, and gases, for example. Most commonly they are used on aerosol cans, in which case they may be referred to as spray heads. The actuator may have a stem which projects downwards into the valve (often referred to as a female valve) to be actuated or may have a downwardly open cavity for receiving a stem of the valve (often referred to as a male valve or stem valve). Normally the valve is actuated by depressing the body of the dispensing actuator, but it is possible to provide a valve which is actuated by tilting or turning the body of the actuator.

It would be desirable to be able to provide a dispensing actuator which permits the flow of pressurised fluid to be varied.

The present invention provides a dispensing actuator comprising an outlet portion or head having first and second outlet passageways, the outlet portion being slidable to a first dispensing position, in which the first outlet passageway can receive pressurised fluid, and to a second dispensing position, in which the second outlet passageway can receive pressurised fluid.

Accordingly, pressurised fluid can be selectively dispensed through the first and second outlet passageways, which may provide different flow rates and/or differently shaped jets or sprays, for example.

The number of outlet passageways and dispensing positions is not limited to two. In particular, a third dispensing position may be provided between the first and second positions, for example.

The outlet portion or head may be slidable to a non-dispensing position (preferably between the first and second positions).

The outlet portion or head may be located in each of the said positions by a protuberance on one of the said portions engaging in a recess. Preferably, co-operating abutment surfaces define the said first and second positions. For example, a projecting part of the head may run in a blind-ended groove or channel.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an axial section of a dispensing actuator in a first embodiment, with an outlet portion or head shown in a non-dispensing position;

Figure 2 is an axial section taken at 90° to that of Figure 1, with the outlet portion or head shown in a first dispensing position;

Figure 3 is an axial section of a second embodiment of the dispensing actuator, on an aerosol can, with the outlet portion or head shown in a second dispensing position;

Figure 4 is an axial section taken at 90° to that of Figure 3;

Figure 5 is a view similar to Figure 4, showing a body of the actuator depressed to actuate a valve; and

Figure 6 is an axial section of a third embodiment of the dispensing actuator, on an aerosol can, with the outlet portion or head shown in a non-dispensing position.

The dispensing actuator illustrated is for use on a pressurised container or aerosol can 5 (Figs 3 to 6) of conventional construction including a conventional valve having a hollow actuating element or stem 10 which extends upwards and is depressed downwards to open the valve. The actuator has an axis 1 which coincides with the vertical axis of the valve stem 10.

Referring to Figures 1 and 2, which show a first embodiment, the actuator includes an inlet portion or body 2 and an outlet portion or head 3

which is slidable in a direction transverse to the axis 1. A base member or collar 4 fits on the aerosol can and retains the body 2 while allowing it to be depressed to actuate the valve.

The head 3 has a downwardly projecting extension or neck 6, which is of substantially rectangular horizontal cross-section and which runs in a blind-ended groove or channel 7 formed in the body 2. The body 2 retains the head 3 by means of ribs 8 engaging in grooves in the neck 6. Figure 1 shows the head 3 in a non-dispensing position and Figure 2 shows the head 3 in a first dispensing position, in which the left-hand end surface 6a (Fig. 1) abuts against the corresponding end surface 7a of the channel 7; in a second dispensing position (not shown) the opposite end surface 6b of the neck 6 abuts against the other end 7b of the channel. In moving between the first and second dispensing positions the head slides along the ribs 8.

The body 2 includes a depending stub 9 whose lower end has a generally cylindrical cavity 11 for receiving the valve stem, the lower edge 12 of the cavity being bevelled in order to facilitate assembly. A rising, substantially vertical, inlet passageway or port 13 (co-axial with the axis 1) in the body 2 communicates between the cavity 11 and the base surface 7c of the channel 7, the exit of the port 13 being in the centre of a rounded protuberance 14 provided on the base surface 7c.

The head 3 contains first and second outlet passageways or ducts 16a, 16b whose axes are vertical and lie on the median longitudinal plane of the channel 7, which also contains the axis 1.

In the non-dispensing position (Fig. 1) the exit of the inlet port 13 is closed by a solid part 17 of the head 3 having a recess in which the protuberance 14 engages so as to provide a fluid-tight seal and to locate the head 3 in this central position. In the first dispensing position (Fig. 2) the entrance of the first outlet duct 16a is in register with the inlet port 13 and serves as a recess engaging the protuberance 14. Similarly, in the second

dispensing position the entrance of the second outlet duct 16b is in register with the exit of the inlet port 13.

Each outlet duct 16a or b includes an annular outlet opening 18a or b containing a hollow element 19 (Fig. 2) known as a mechanical break-up insert, which is of a type well known to those skilled in the art of aerosols and need not be described in detail; it has an outlet orifice which emits a fine spray of liquid droplets. The outlet openings 18a and 18b are designed slightly differently from each other so as to provide different flow rates and different spray parameters. The outlet openings 18a and 18b face towards the front and are symmetrically arranged so that when the head is in the first or second dispensing position, the axis 21 of the corresponding first or second outlet opening 18a or b intersects the axis 1 of the dispensing actuator. Thus, in either of the dispensing positions the dispensing actuator will dispense a spray of fluid from the same location and in the same direction, this facilitating use of the dispensing actuator.

The forwardly facing arrangement of the outlet openings 18a and 18b also facilitates the fitting of the inserts 19 during assembly of the dispensing actuator. The inserts 19 may be of the same or different types. This will affect both the flow rate through the dispensing channels and also the angle of the spray as the aerosol is dispensed. The inserts may or may not be fitted against a centre-post 20, and this choice will depend upon the precise nature of the aerosol. For some aerosols, a centre-post will not be required.

It will be appreciated that the body 2 and head 3 may be made of plastics materials such as polypropylene and polyethylene. Preferably the body 2 is made softer than the head 3 so as to enhance the seal between the the protuberance 14 and the ducts in the neck 6. For the same purpose, the body 2 may be made of a thermoplastic elastomer. The choice of material is not restricted to those mentioned above, and care needs to be taken to ensure compatibility with the aerosol product.

Various modifications may be made within the scope of the invention. For example, the outlet ducts 16a and 16b may be of different passage cross-section. The stub 9 could be made narrower and extended downwards further to serve as a stem for actuating a female valve instead of actuating the stem of a male valve. The body 2 may be connected to the collar 4 by a hinge (e.g. an integral hinge) or by flexible parts allowing the body 2 to be moved up and down relative to the collar 4.

Figures 3 to 5 show a second embodiment of the dispensing actuator, in which the body 2 is integrally hinged to the collar 4 so as to be pivotable to depress the valve stem 10, as in Figure 5. In this embodiment, the inlet passageway (13) of the first embodiment is incorporated with each outlet passageway (16a, 16b); the first and second outlet passageways 16a and 16b extend downwards into respective first and second valve-actuating parts or stubs 15a and 15b each having the same function as the above-described stub 9. This embodiment facilitates prevention of leakage.

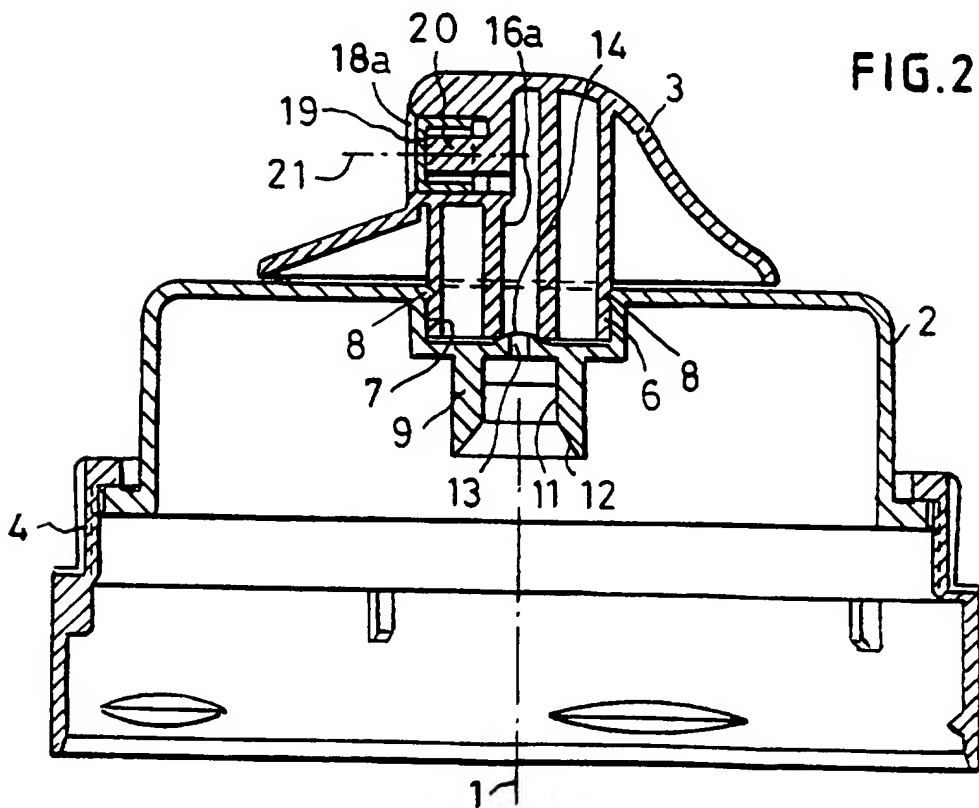
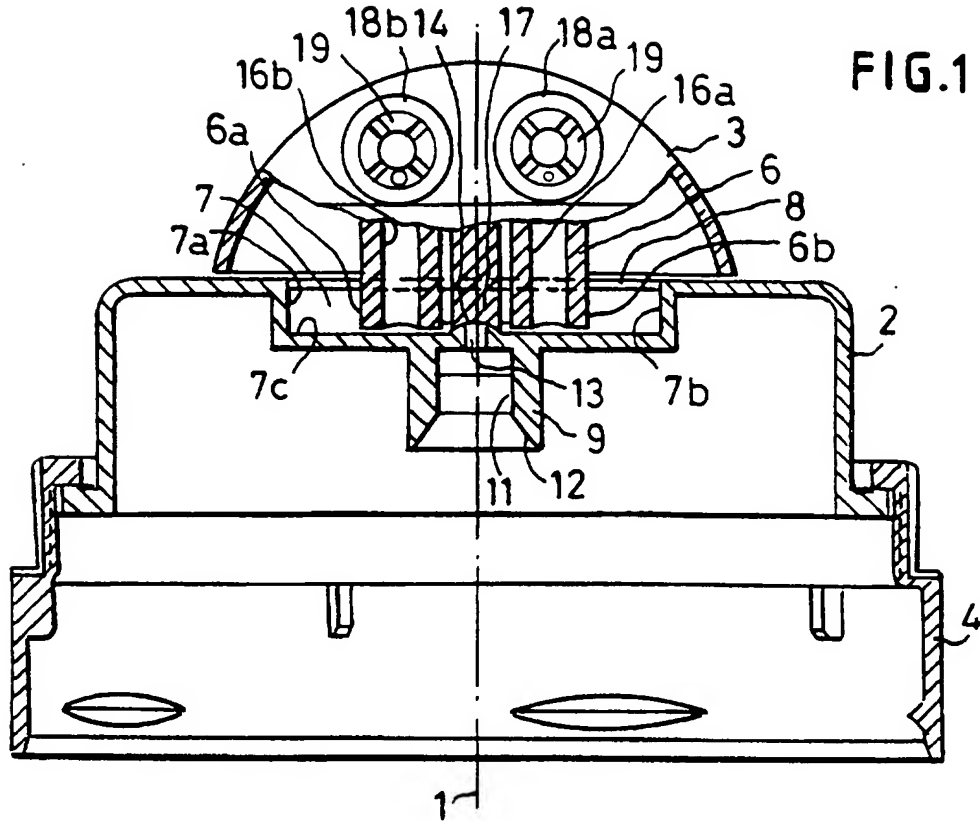
Figure 6 shows a third embodiment of the dispensing actuator, which is a modification of the second embodiment. A solid part 22 is provided between the stubs 15a and 15b so as to block off the upper end of the valve stem 10 when the head 3 is slid to the non-dispensing position (as shown), thereby preventing accidental dispensing of pressurised fluid.

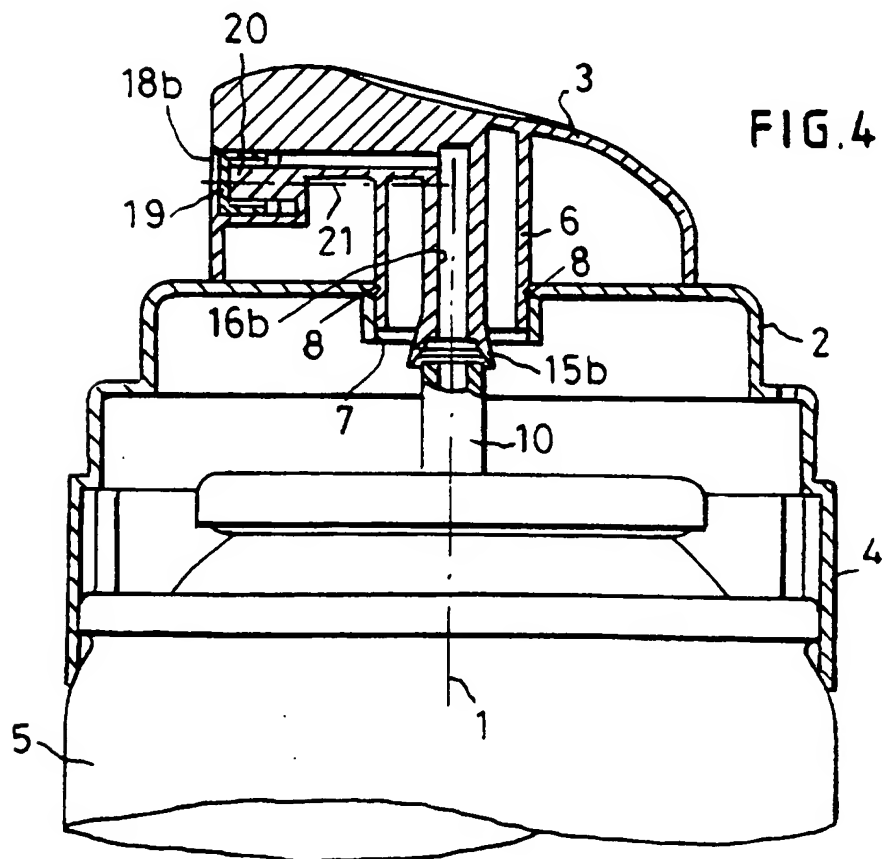
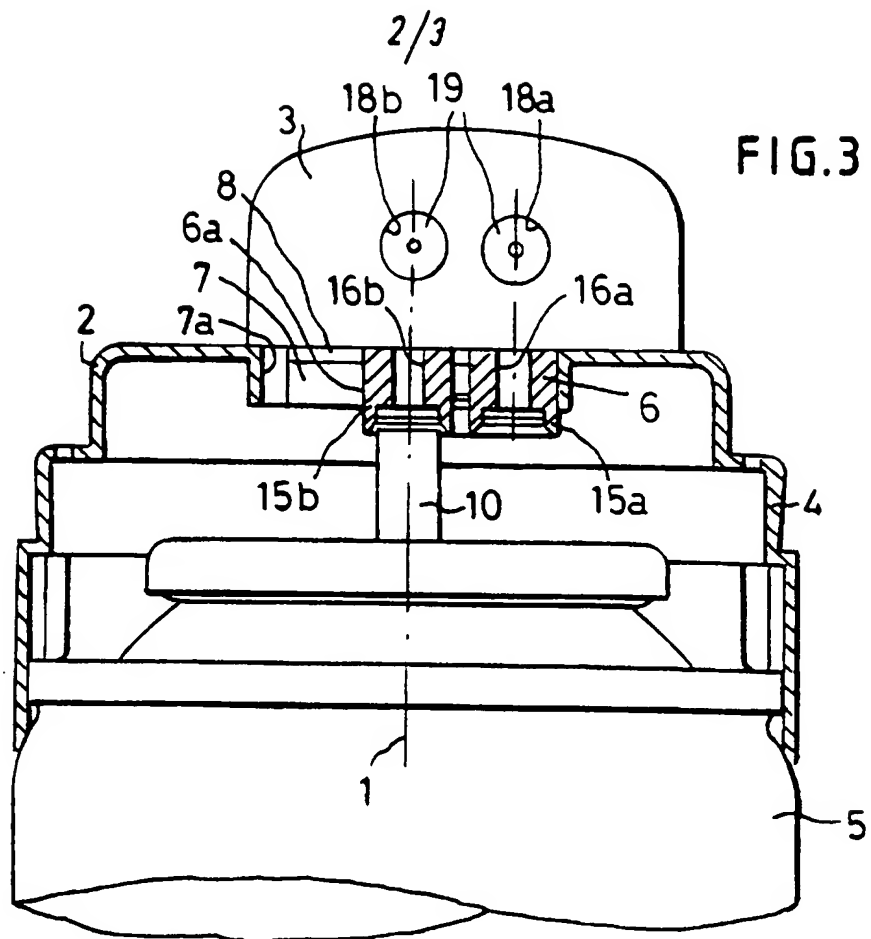
CLAIMS:

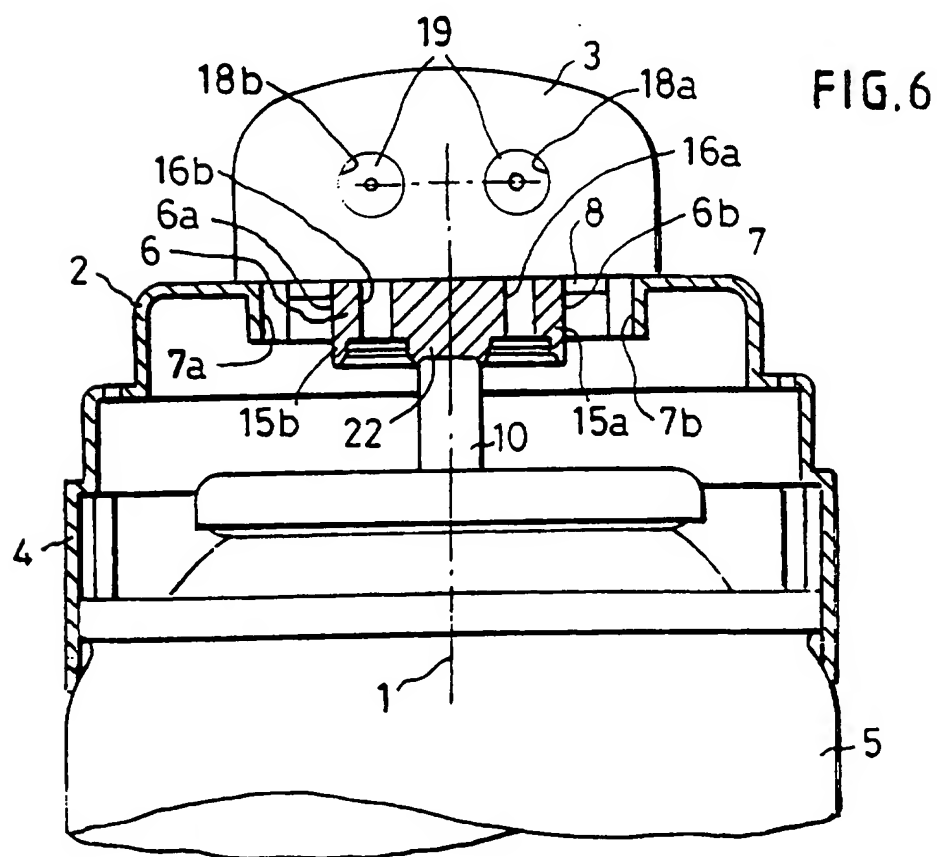
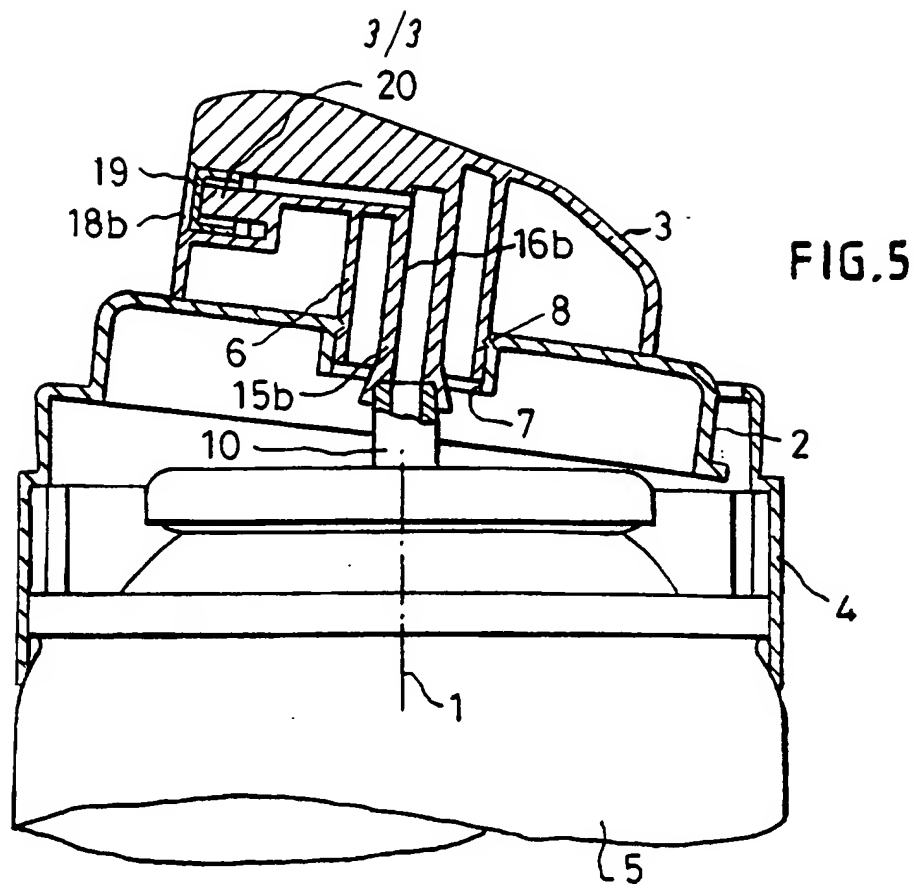
1. A dispensing actuator for actuating an outlet valve on a container of pressurised fluid which is to be dispensed through the actuator, the dispensing actuator comprising:
 - (a) a base member (4) for mounting on the container;
 - (b) a body (2) which is mounted on the base member (4) so as to be movable to allow opening of the valve; and
 - (c) an outlet head (3) having first and second outlet passageways (16a,16b), the head (3) being mounted on the body (2) so as to be slidable to a first dispensing position, in which the first outlet passageway (16a) can receive pressurised fluid from the outlet valve, and to a second dispensing position, in which the second outlet passageway (16b) can receive pressurised fluid from the outlet valve.
2. A dispensing actuator as claimed in claim 1, in which the head (3) has a downwardly projecting extension (6) slidably received in a channel (7) in the body (2).
3. A dispensing actuator as claimed in claim 1 or 2, in which the head (3) is slidable to a non-dispensing position in which the head (3) can prevent the pressurised fluid from being dispensed when the valve is actuated.
4. A dispensing actuator as claimed in any of claims 1 to 3, in which the body (2) has a valve-actuating part (9) with an inlet passageway (11), the first and second outlet passageways (16a,16b) being in register with the inlet passageway (11) in the respective first and second dispensing positions of the head (3).

5. A dispensing actuator as claimed in any of claims 1 to 3, in which the first and second outlet passageways (16a,16b) extend into respective first and second valve-actuating parts (15a,15b) of the head (3).
6. A dispensing actuator as claimed in claim 5, in which the head (3) has a solid part (22) for preventing the pressurised fluid from being dispensed when the head (3) is in a non-dispensing position between the first and second dispensing positions.
7. Dispensing apparatus comprising:
 - (a) a pressurised fluid container (5) with an outlet valve having an element (10) which is actuatable to open the valve;
 - (b) a body (2) which is mounted on the container (5) so as to be movable to open the valve; and
 - (c) an outlet head (3) having first and second outlet passageways (16a,16b), the head (3) being mounted on the body (2) so as to be slidable to respective first and second dispensing positions in which the respective first and second passageways (16a,16b) are in register with the outlet valve and can receive pressurised fluid from the outlet valve.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65D83/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 3 711 030 A (JONES) 16 January 1973 see column 2, line 51 - column 4, line 37; figures 1-8	1,4,5,7 2,3,5,6
Y	--- US 3 386 631 A (KOTUBY) 4 June 1968 see column 3, line 3-25; figures 1-6	2,3,5,6
X	--- FR 2 149 971 A (COLGATE-PALMOLIVE COMP.) 30 March 1973 see page 3-7; figures 1-9 -----	1,3-5,7

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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